Polititico-economic premises for an evolutionary stabilization and integration of the Commonwealth of the Independent States

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Abstract

According to the general living systems theory, evolution of societies depends primarily upon accumulation and transmission of learned information (see Miller, 1978: 854). Despite the overall trend, evolution does not in every case progress in the direction of greater complexity, adaptability, self-regulation, and social integration. In fact, collective learning processes can also proceed in pathological forms (see Miller, 1986: 428-440; Ryzhenkov, 1992, 1993). This paper focuses on the declining investments, runaway inflation and other major pathological phenomena in the transformation processes in the Commonwealth of the Independent States. It is shown, based on the analysis of the actual development and on simulation/gaming experiments with a model of a capitalist economy, that the present vicious circle of inflation and declining investments (on the example of Russia) could be converted to a virtuous circle of growing investment and real incomes. A voluntary learning and massive transfer of knowledge from the more developed countries to the CIS may promote the favourable turn. Thus, this report offers a definite framework for understanding current events as well as for developing and testing long-term decisions and strategies. This framework is also used for policy recommendations.

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To be in hell is to drift; to be in heaven is to steer.
George Bernard Shaw

1. Introduction

The representatives of the global community have postulated that international development co-operation should devote increased attention to the enhancement of each country 's human and institutional capabilities to assess, select, create and/or import, and apply technologies for development (UN General Assembly Resolution No. 44 of 1989). This necessity is especially acute for the successors of the former USSR facing growing technological gap with the West and seeking integration in the world economy.

In the world economy, the 15.4% of the population living in the highest income group produce 78.6% of the total world income. This group has an income per capita 8 times higher than that in the middle group (26.2% of the population) and 59 times higher than that of the rest of the humanity (58.4 % of the population), on the average. Whereas Russia, on the one hand, was in 1991 in the second group, Tajikistan, on the other hand, - in the third; the rest of the CIS was somewhere in between (see Tables 1 and 2).

The territory of the former USSR is the domain of social and economic structures ranging from semi-patriarchal communal relations and relations, typical for the Oriental civilization, to private capitalist and state capitalist socio-economic forms. Different social norms, values, cultural traditions and ways of life are not separable from elements of the common systemic memory and kinship. "Historically, Soviet economic culture appeared as a superstructure above an entrenched edifice of communal traditions and a very strong etatism. The main features of economic behaviours were egalitarianism, group-oriented economic activity, habits of receiving free aid, and the appellation to the authority of the state as a trouble-shooter" (Rosser, 1993: 815). There is a rather limited fund of social and technological knowledge in these countries.

The political, economic and social conditions in the countries of the CIS have been showing more and more similarities to some of the major problems known in the developing countries: a severe economic strain due to foreign indebtedness, a low and continuously falling per capita income, political destabilization as a result of pauperization. For these countries the current problem is not how to become less poor but how to stop becoming even poorer because of declining levels of investment and capital flight. Unlike the developing countries, Russia, Ukraine and other members of the CIS can draw considerable potentials (a high level of education, technological know-how and a high degree of industrialization) that could facilitate their evolutionary stabilization and integration.

Tensions and militant conflicts, economic, political and ecological crises, the surge of aggressive nationalism, matter-energy deficiencies and abnormalities in information processing in the area of the former USSR are of global concern. The existence of the

CIS is only possible if the pathological conditions can be outweighted by factors that favoured continuation of this system.

We think, a mobilization of the potential of the CIS economy as a prerequisite for its integration into the global economy is also in the political and economic interests of the OECD-states. A scenario of an evolutionary (instead of pathological) stabilization and protracted integration is the best alternative to scenarios of national revanchism or national decay, especially in view of the tragedy of nations in the former Yugoslavia (the SFRU).

The general living system theory provides us with a number of essential requirements for successful integration of component societies. "They are (a) compatibility of important values; (b) a distinctive way of life; (c) expectations of economic gains; (d) marked increase in the political and administrative capabilities of some participating units; (e) superior economic growth of at least some units; (f) open channels of communication among geographic areas and social strata; (g) broadening of the political elite; (h) mobility of persons, at least those who are politically relevant; and (i) many different sorts of communication and transactions among components. Others that may be essential are (a) balance of rewards, initiatives, and respect among participants; (b) frequent changes of roles in system processes so that no divisions between majority and minority become permanent; and (c) a good deal of mutual predictability of behaviour" (Miller, 1978: 970). A permanence of the boundaries of the constituent units is among the factors compelling integration too.

In the last months we have witnessed the substantial progress towards a closer political, economic and military integration of the Independent States and - what is more - that Russia has taken a leading part in the "orchestra". Ten of the former Soviet republics signed a treaty of economic union in September 1993. They agreed to "gradually build a common economic space on the basis of market relations" via:
- gradual reduction and eventual abolition of all customs tariffs and other internal trade barriers;
- equal legal status for one another companies, to encourage jointly-owned companies,
- a payment union, or multi-currency clearing system to be run through an Inter-state Bank (see Boulton, 1993). At the Ashkhabad summit in December 1993, the heads of the twelve of the Independent States have agreed, in particular, to co-ordinate price and tax policies, remove customs for reciprocal shipments, and protect investment. Prices for the most important commodities of the inter-republican trade will be not changed spontaneously and will be fixed according to a mutual agreement. Russia will be chair in the CIS for the next months (a chair will be rotated).

In Europe, the Russian gross domestic product (adjusted for the purchasing power parity) is the greatest but one ($940 billion compared with $1235 billion in Germany in 1991). In 1991 per capita, Russia's GDP was 60%, private consumption - 58% of the average European figures. Labour productivity in industry amounted to 58%, in agriculture - 41% of the European averages. The country was somewhere between 25 and

27 positions in the European ranking of economic development (see B. Bolotin in Argumenty i Fakty, 1992, No. 20, p. 4).

Ms. S. Nasar argues: "Relative to its low per-capita income - half of Korea's and about the same as Mexico's - Russia has a well-educated work force and lots of material resources" (The New York Times, 20.1.1992, p. D1, D8). Wages are now estimated by some experts, close to the Government, to have averaged $105 a month in December 1993, with prices at about 30 per cent of those in the US (see The Financial Times, January 7, 1993, p. 2). Russia is the mostly self-sufficient country among the group under consideration (see Table 3). Russia provides the other republics with information (scientific and technological information, financial and banking services, management consulting, etc.), matter-energy (means of production, consumer goods, weaponry) and it is the main market for their commodities. There is a close economic dependence of its firms on component-suppliers. Economic potential of Russia is greater than that of all other republics of the USSR in toto. It has by far the largest army. The need to safeguard interests of Russia's producers/consumers as well as the interests of the 25 million Russian-speakers living in the near abroad are determining to ever greater extent the priorities of Russia's foreign policy. There have been disagreements between Russia and Ukraine over military and economic policy, the Crimea and the Black Sea Navy.

Russia has big positive surpluses in the trade with the other republics of the CIS. The transition burdens in other republics of the CIS have been severer than in Russia, in spite of its generous aid to them. A total amount of financial resources gratuitously transferred by the Central Bank of the Russian Federation to the central banks of the other members of the CIS was equal to 1,5 trillion ruble, or $7 billion according to the exchange rate (ca. 8% of the Russian GDP). After this "technical crediting" of the near abroad was terminated Russia's Central Bank begun to use another channel, namely, cash transfers: 1,5 trillion ruble were "gifted" to the members of the CIS. Turkmenistan und Kazakhstan have got per capita in 1993 more cash than the emission in Russia itself (see Table 4). Moreover, much of Russia's energy supplies into the near abroad has been exported at subsidized rates. The other republics have profited from these lump sums from the country whose own population has experienced the acute austerity and almost hyperinflation, partially fuelled by these transfers into the near abroad.

The total gratuitous help to Turkmenistan, Kazakhstan and Uzbekistan has amounted to 45-70 % of their GDP, or almost total wages and salaries in these republics (see Table 5). These heroic transfers from one country to others, politically independent, have been, very likely, almost unprecedented in the world economy. They may be compared, to my knowledge, only with transfers within the former USSR, between old and new federal lands in Germany (yet in both cases - *within* the federal states) and, to a lesser extent, with the foreign aid to Israel, to Republic of Korea and to Taiwan (mainly by the USA) in some years after the World War II. At the same time it has been painfully clear that the U.S. and its allies have had no will to mount a Mar-

shall Plan-style rescue. The IMF, for example, provided Russia only $1.5 billion as an aid package (see the International Herald Tribune, December 23, 1993, p. 4).

It is now notably visible that the CIS stabilization and integration are doomed to failure without Russia's home success. The Russian "great depression" is very likely the main factor delaying the Commonwealth overall stabilization and integration. The analysis of Russia's economic problems and their underlying causes constitutes the main part of this paper. The study uses the interdisciplinary approach to define plausible outcomes of today's turbulence, and to provide clear signposts of long-term directions, the opportunities and pitfalls facing the new Russia and the CIS as a whole.

There are rather wide spread fears in the West, in countries of the Central and Eastern Europe about restoration of Russia's imperial oppression, economic and political turmoil at a greater scale than in Russia itself (see, for example, Die Welt, 13. Januar, 1994). It is shown that these possibilities are not inevitable if governance does not lag behind challenges and imperatives of the rapidly changing world.

2. The Pathological State

The USSR socio-economic form proved to be inefficient for managing modern technological progress and failed in competition with capitalism[1)]. The main economic shortcomings are listed below:

- a diminishing scale of investment activity - morally and physically obsolete technology and capital stock (mostly in a civil sector of the economy)[2)];
- an increasing destruction of environment - an ever greater substitution of surplus labour by barbarous exploitation of nature[3)] ;
- huge losses in production, a hidden mass unemployment in the industry and agriculture;
- weak motivation of workmen and deteriorating labour morale;
- an overexpansion of the military-industrial complex[4)];
- high deficits of the state budget (1980 - 2.4, 1990 - 8.2 % of the USSR's national income, 1991 (in Russia) - 31% of the GDP), the growing internal state indebtedness (1985 - 18.2, 1988 - 35.6, 1990 - 54.7 % of the GDP);
- high deficits of the balance of payments (the estimated magnitude of capital flight from the USSR at the end of the Union existence (1991) was about $14 billion - see Frankfurter Allgemeine Zeitung, 4.2.1992, 13.2.1992 and Table 6).

The influence and power of the former USSR for decades supported integration among the Soviet Republics. Still the Soviet Union turned into a pathological system in which important variables remained for a significant period of time beyond their ranges of stability, therefore the costs of adjustment processes were significantly increased. The system 's control was lost because its information transmissions were full of noise or very slow. Its state-controlled economy failed for, in part , it turned out to be impossible to control centrally the dynamics and vast detailed complexity of the

Soviet economy. The arms race also overburdened the less effective economy of the super-powers (cf. Senge, 1990: 395).

The stagnation and decline exposed the parasitic groups and layers of bureaucracy, which instead of promoting conditions that could have encouraged the extention of greater resources depleted the state resources. At the same time, the Soviet society shacked up by *glasnost* (partial and rather contradictory reforms towards political liberalization) and *perestroika* (similar reforms towards economic liberalization) was not capable to create an efficient public administration. Rosser writes: "The economic underpinnings of the new thinking were the growing dissatisfaction with the system's inability to respond to external changes and its overall inadequacy in a world of accelerated changes". "The main outcomes of the initial stage of reforms were economic decentralization, the legal reinstatement of private property, and the opening up of the economy" (Rosser, 1993: 814). The immediate exposure of the country to the external environment was thought to be a means of fighting the system's sclerosis. I would add that the reinstatement of private property substantially legalized the shadow and black economy.

According to the general living system theory, a pathological system has a spectrum of possibilities:
- restoration of negative feedbacks by itself;
- parasitic or symbiotic union with more capable systems;
- decomposition in components (the next lager system takes over control).
The relevant hypothesis states that "up to a certain amount of stress, systems do more centralized deciding when not under stress. Beyond that amount, deciding becomes increasingly decentralized until the system terminates or the stress abates" (Miller, 1978: 109). It should be noted that normally segregated systems, such as federations, need more transmission of information than integrated ones.

Under the decelerating economic growth, stagnation and crisis available reserves were in ever more short supply. The system could not keep its components adjusted to one another or to the environment, while they were competing with each other for increasingly limited resources with intensifying aggressiveness. As a result of the prolonged pathology, the processes of decline, termination and disintegration proceeded.

For curing the disease, the IMF prescribed the same set of reforms to the 15 republics as it did to the post-communist nations of East Europe: they should as quickly as they can freeing up the system, privatizing, bringing the deficit of the budget right down, to about zero. Monetary policy should be kept under control. Credit policy should be appropriately tight to prevent price shocks from creeping through into permanent high inflation, and there should be restraints on wages. The "realistic" (devaluated) exchange rate of the national currency should be introduced for promotion of foreign trade and for price stability. They should turn their lands of the heavy hand into the lands of invisible one in order to modernize, consolidate and restructure their economies and integrate them into the world economy. Fiscal stability and repayment of foreign debts were declared to be of the highest priority.

The Commonwealth of the Independent States was founded in December 1991. It has assumed control of the remaining parts of the USSR. Russia's President B. Yeltsin insisted that the republics would be able to co-ordinate their policies without reviving the old centre, and denied charges about Russian domination. "We do not intend to build commonwealth based on Russia...We are equal among equals", - he said (The Times, December 30, 1991, p. 1). This group of countries has not declared its supranational nature (mainly respecting the Ukraine objections) and is still characterized by a rather weak central decider[5]. Their segregation from each other at first increased a number and intensity of their contradictions and conflicts. The magnitudes of the problems facing the new republics are unprecedented. The republics of the former USSR were poorly prepared to a rapid transition to an independent market economy. Yet Russia's new leadership followed the monetarists' prescriptions of the comprehensive reforms ("big bang") and initiated a rapid and dramatic liberalization of the economy.

The developments in the CIS, after economic liberalization was enforced in Russia on January 2, 1992, did not refute the warning of serious Soviet economists that internal convertibility of immediate nature would lead to a disaster in the foreign exchange sector and would teach nothing to the Soviets on how to modernize their production system (see Section 4 below).

The pathology has manifested itself in the following forms:
- distortion of the inter-republican division of labour, barter as a palliative;
- run-away inflation (in Ukraine up to 70 % a month), loss of faith in money issued by the government(s),
- exporting inflation to neighbours in the ruble zone either via money emission or via credit expansion by the central banks and simultaneous protecting internal commodity markets from non-residential buyers[6];
- lack of control of stability of the central decider(s),
- civil and local wars,
- deepening structural economic crises,
- abrupt reduction of private consumption of the majority of the population, growing differentiation of living standards among the inhabitants of these countries (see Tables 7 and 8), etc. This pathology has not yet been completely overcome.

The collapse of the USSR required from each republic to be more self-sufficient than earlier. Partipotential systems of the countries collided with consequences of disintegration of a far more totipotential system of the former USSR which was capable of a greater number of critical subsystem processes as each republic[7]. Disruptions of production because of lack of assembling parts, of raw materials or because of poor payment discipline became wide-spread (for example, a textile fabric in Ivanovo suffered from broken cotton deliveries from Uzbekistan, stoppages of timber shipments from Russia were detrimental for pits in Ukraine, etc.).

The processes of redistribution of power, property, rights/responsibilities, international obligations, of forming new institutions, behavioural norms and patterns are still

under way. These processes have been determining the direction, intensity and duration of many conflicts, which may be superficially perceived as purely ethnic or religious. (The issue of minorities' rights often merges with territorial disputes.) The mostly common object of conflicts among these countries, lagging behind societies of the third wave in Tofflers' terminology (see Toffler A. and H. Toffler), are either territory (for example, a conflict between Armenia and Azerbaijan over Nagorno-Karabakh and over a common border), natural resources (land, water, hydrocarbons, etc.) or raw materials necessary for their plants (iron, steel, timber, petrochemicals and other). Such conflicts have been often consciously instrumentalized by those influent groups of the old and/or new political elite and by criminal/mafia bosses that profited from the economic chaos and wars.

3. Russia's deindustrialization

Privatization

Adepts of shock therapy claim that privatization is the great success of the past two years (The Financial Times, 7.01.94, p. 15). It was believed that privatization would create strong management incentives to restructure, reduce cross-subsidizing/redistribution of profits, introduce a tight budget constraint on managers and so on. In the meantime, 67 % of enterprises are still owned by the state. Private trade is providing 33 % of retail trade (in Tataria, Bashkiria less than 9 %). The state enterprises get 75 % of all loans, the property of enterprises went bankrupt amounts to 2 % of the whole property privatized. 80 % of private corporations are at least formally controlled by their employees (see: Livshits). The present technological system, especially its transportation and communication subsystem, is not ready for a rapid privatization and will probably hinder the radical economic reform. Technological reconstruction of the economy may take 15 years or more (see Valtukh, 1992).

Slumpflation

Inflation that was running at nearly 30 % in August 1993 has been squeezed to around 12 % in Decemer (The Financial Times, January 7, 1994, p. 2). Russian economists estimated the aggregated level of non-military industrial production in Russia: March 1993 - 64.4, April 1993 - 63,35 (%) compared with the beginning of 1990 (100%) (see Finansovyie Izvestia, No. 34, 19-25.06.1993, p. VIII). The Makroekon-link institute, part of the State Statistics Committee, claimed that GDP slumped in 1993 by 12 per cent on 1992, and by 29 per cent on 1991, with national income down 13 per cent and production down 16 per cent on 1992 (see The Financial Times, January 12, 1993, p. 1). The production is generally degrading, output of the carriers of the technological progress is impetuously declining. Yet there have been some zones of stability (a drop less than 3% in 1993) and even growth (durable consumer goods, canned food, gas industry, electroenergetics, subbranches of machine-building and others).

There are excess capacities as a result of the protracted slump. The operational rate in the Russian industry is near 90 % - at 10 % , 51-89% - at 57% , lesser than 50% - at

31%, lesser than 30% - at 8% of all the enterprises. "It is not already a crisis. It is destruction" (Livshits A. The Economic Situation in Russia. - Nezavisimaya Gazeta, December 23, 1993, p. 4). Internal prices impetuously approaching the world level. Industrial production is ever more strongly feeling hard demand constraints. Downsizing can create a vicious circle that deepens and prolongs the downturn (the Keynesian consumption multiplier reflects this positive feed-back loop).

A conversion of the military-industrial complex (MIC)

There are 3 million employees in assembling of armaments. 1.5 million highly qualified employees have left the MIC. Production of armaments in 1992 has been shortened by more than 60% (Frankfurter Allgemeine Zeitung, 13.12.1993, p. 15). The share of military equipment in the output of the MIC has been reduced from 56 % in 1988 to 20 % in 1993 (see Livshits).

Declining investments

The Russian economy has been a repeller rather than attractor for capital. Productive investments in Russia's industry compared with a previous year (%):
1991 - 73, 1992 - 50. There is a critical situation - near physical decay - of production capacities in electroenergetics, timber processing, metallurgy, chemical industry, transport engineering (see Valtsman: 26, 34). House-building went down to the level of 1956 (Frankfurter Allgemeine Zeitung, 21.4.93). Russia's need for the conversion of the MIC is equal to $150 billion over 7 years (Frankfurter Allgemeine Zeitung, 27. Oktober 1992).

The national financing of science and education is reduced not only absolutely (in real terms) but relatively too (measured as a percentage of the GDP). R&D investment accounted for 2.1 per cent of the GDP in 1990, fell to 1.4 per cent in 1991. Of the estimated 950, 000 people working in R&D in Russia (excluding space research) in 1991, 200, 000 - 300, 000 people left the system with further cuts expected (see OECD, 1993; The Financial Times, October 13, 1993, p. 3).

Aging and worming out of fixed assets, disinvesting are thus the painful characteristic (investment are not providing even simple reproduction; in fact, the country is investing only 25 per cent of the national amortization fund. See Nezavisimaya Gazeta, 23.12.93. p. 4). Despite Russia's hunger for investment finance, banks avoid lending within the country - except to clients which earn hard currency and are well-known to them - due to a lack of mechanism to ensure repayment. In spite of the international high-stakes quest for hydrocarbons in some resource-rich regions foreign investment in Russia is still very small (up to 1993 near $7 billion in total, see "24", 22.10.93, p.3). Unlike China and India, Russia is still not able to attract mobile capital from abroad.

Russian Export and Import

The general export-import turnover is moving downward, in spite of a substantial increase (200-300%) of the export of rare and non-ferrous metals in the last 2-3 years. In January-August 1993 compared with January-August 1992, Russia's export to the West was equal to $24.7 billion (+11%), the western import to Russia was equal to $11.9 billion (-53%, the drop of the machinery and equipment import -60%). Joint ventures are providing 11% of the Russian export (Business MN No. 43, 24.10.1993, p. B 14). Raw materials, energy are the main items of the export. Whereas raw materials and energy provide 80% of Russia's total export, their share in China is already 20 % (Frankfurter Allgemeine Zeitung, 27.5.93, p. 17).

The export of armaments, the last important source of hard currency, has been also declining:

Armaments export ($ billion)					Share in the world export (%)	
USSR			Russia		USSR	USSR
1987	1989	1991	1992	1993	1987	1991
22.6	15	4	3,5	2,5	39	18

Source: Pravda, June 16, 1992, p. 2, Frankfurter Allgemeine Zeitung, 19. Juni, 1992, p. 6; The Financial Times, 1.12.1993.

Note: According to the international press, the Russian Government is planning to increase the export of weaponry from $2,5 billion in 1993 to $9 billion in 1994. The CIA and Pentagon predicted that the Russian Government would actively support armaments export and Russia would offer the modern weaponry at dumping prices and more often accept barter (Izvestia, 9.6.92, p. 1).

Capital flight

According to Russia's Foreign Economic Relations Ministry, Russia in 1992 lost $6.4 billion through unfavourable barter deals where Russian exporters underestimated the value of what they were bartering to keep the difference abroad in undeclared accounts. The deposits of Russian exporters in the West are estimated to be about $25 billion. By June 1993, all Russian banks held about $15.5 billion abroad. Loans within Russia were worth about 3% of that sum: many Russian companies with export potential have money but do not trust the national currency or the authorities enough to keep it at home in ruble (see Frankfurter Allgemeine Zeitung, 4.2.1992, 13.2.1992; Die Zeit, 15.10.1993, The Wall Street Journal Europe, 22.3.1993).

"External convertibility, translated into the capacity of re-exporting profits and an acquired credibility of the ruble's exchange rate can indeed offer a major contribution [for the recovery of the productive structures of the country. - A. R.], but only if far more basic factors (political stability, certainty of the legal framework and an environment favourable to investment) are in force" (Bortolani, 1993: 27).

Depreciation of the national currency

A unified commercial rate for current transactions was introduced for the first time on November 1, 1990 at a level 1.8 ruble = 1$ vis-a-vis the official rate of 0.6 ruble = 1$. It made easier the repatriation of profits by joint-ventures. Currently**,** dollar rather than rouble is one of the most common stores of personal wealth. The cross rate: dollar = 1229 Russ. ruble (The International Herald Tribune, 11-12.12.93, p. 11), dollar = 1250 Russ. ruble (The International Herald Tribune, 23.12.93, p. 9).

At the same time, ruble is becoming harder and harder in relation to the other new currencies of the CIS (see Finansovye Izvestiya, 30.12.1993-12.1.1994, No. 61, p. IV). The contraction of the ruble zone to the territory of Russia and Tajikistan in 1993 could probably help to enforce a stricter control over inflation in Russia and in the other republics of the CIS. No credits were advanced to neighbouring states from October 1993, after a rate of advance reached nearly 5 per cent of Russian GDP in July 1993 (The Financial Times, January 7, 1993, p. 2). A multi-lateral clearing system is to be created.

Budget deficit

The IMF insisted in 1992 that Russia pare its budget deficit to 5% of its GDP; the actual deficit was 20 %. The 1993 deficit was likely to exceed 10%.

	1991	1Q 1992	1992	1993
Budget deficit as the percentage of the GDP	31	1.5	20	10

Sources: (Parker: 5-6) and (Desai).

The attempt to eliminate the budget deficit within the first quarter of 1992 has aggravated the decline of production and made even many efficient enterprises insolvent. Unlike Government's projections, enterprises answered to credit tightening under the deteriorating ruble-dollar exchange rate not by a cost reduction but by a price increase despite a declining consumer demand. The sharply worsening economy and popular discontent on the rise forced the Government to provide factories and farms with subsidies and cheap credits at a broader scale to avoid a chain reaction of insolvency. Dr. A. Chernov from the Radio "Liberty" said that 50% of potential export taxes are not collected by the state. If they were collected there was no budget deficit at all in 1992. There is still no infrastructure to deal with mass bankruptcies.

"The ruble, a soft currency and steadily depreciating monetary unit, also carries part of the blame for Russia's non-payment crisis with an estimated R13 billion worth of defaulted settlement in early October" (BWW,1993, No. 40, p. 2). Overdue liabilities of Russian enterprises (in the real terms) have been reduced to the level a little bit lower than in March 1992 (Finansovye Izvestiya, 30.12.1993-12.1.1994, No. 61, p. II). The drop of inflation from 30 per cent a month in August 1993 to around 12 per

cent in December means that the central bank's interest rates, now at some 17 per cent a month, are strongly positive for the first time since the price liberalization (The Financial Times, January 7, 1993, p. 2).

Chairman of the Central Bank of the Russian Federation Mr Victor Gerashchenko argues that the Central Bank is carrying out a moderately restrictive monetary-credit policy from the beginning of 1993, having transited gradually from the high stable rates of growth of money supply to their slowing-down (see Gerashchenko).

The crisis of the energy sector

A. Gowers writes: "Nothing would do more to help the economy ... than an increase in production and export of oil, Russia's largest hard currency earner by far" (The Financial Times Survey, May 27, 1993, p. YIII). Yet there is relentless slide in oil production:

Russia's oil (incl. condensed gas) output (million tonnes)

1988	1992	1993	1994	1995
517	399	340	300-313	260-297

Note: Compare with a peak in the late 1980s that was close to 600 million tonnes for the USSR as a whole. Capital investments in the industry (%): 1988/1989 - 100, 1992/1993 - 40.

Sources: Izvestia 11.12.93, p.1; Frankfurter Allgemeine Zeitung, 1993, 27. Mai.

The worn out rate of equipment in Russian industry is on the average 50%, in oilprocessing industry - 85% (Pravda, 6.6.1992). There is a chronic shortage of production equipment; 80% of the oil equipment-manufacturing capacity of the former Soviet Union is located in now independent Azerbaijan, whose economy is also far from being recovered.

Mr Yuri Shafranik, the fuel and energy minister, estimated Russia's needs only for modernizing its oil - and gas industry as being equal to $6 billion per year. Morgan Stanly estimates that Russia needs between $15 billion to $20 billion to upgrade its oil and gas industries and reverse declining output. Cutting down wasted energy products, it said, could generate a $15 billion to $25 billion trade surplus, which would go toward finance a broader economic reform (see the Wall Street Journal Europe, 22.3.93, p.1).

Unless drastic measures are taken now to curb the wasteful use of energy by industry, Russia - now still the world 's largest producer - will find it facing the need to import oil. "Opportunities provided by the sheer waste of oil - a third is lost through leaky pipes, wasteful refineries, and inefficient factories - means that most investment in the near future will continue to concentrate on small but highly profitable projects...To date, foreign investments in the oil sector is estimated at $200 million - a relatively small figure by the standard of international oil industry...Until the political system is

stabilized, the search for high returns and quick payback will take precedence over the long-term investment in development that industry needs" (The New York Times, March 6, 1992, p. 15).

The huge consumers' debts (2 Trillion ruble to oil industry, 9 Trillion ruble to energy sector at the end of 1992, see Frankfurter Allgemeine Zeitung, 28.12.92, p. 2) is not diminishing. The internal demand for oil has been declining, as industries - steel, cement, coal and the like - have been shrinking. Oil fields are in disrepair - western oil companies would like to invest in Russia, but they complain of lack of institutional frameworks for investment, plus sprawling bureaucracies and a punitive tax regime.

A crisis of the agricultural sector

The major current problems are listed below (facts are collected from economic journals and from the press):

- low productivity of agriculture; underdevelopment of all the branches of the agribusiness, its retrogressive structure (the relative dominance of agriculture over production of agricultural machinery and equipment and the processing of raw materials and foodstuffs, underinvesting in the food processing transport and storage sectors, no less than two-thirds of the foodprocessing equipment is obsolete and worn out, with much of machinery dating back to 1950s and 1960s, hence growing maintenance and repair expenditures);

- poor organisation of existing collective, state and private farms;
- technical and infrastructural shortfalls of private farm holdings (lack of equipment, of water facilities, of electricity, of proper access by road, etc.); severe budget problems of federal and local governments restrict their ability to pay for public works construction (hence overall offsetting developments and decline in the infrastructure);
- the declining supply of agricultural machinery (for example of fodder and potato harvesters);
- poor storage, agro-industrial and farm-inputs facilities; a high proportion of wastage, product losses between farm gate and consumers; the losses of food and food imports are quantities of the same order; Russia's 1993 grain harvest fell by about 4 million tonnes to 102 million (The Financial Times, 12.1.1994, p. 22);
- the absence of networks and support facilities for agriculture, including credit; at present, most of the processing capacity is located in urban areas close to consumers and to sources of labour - this frequently leads to large losses as the raw material must be transported over long distances on bad roads;
- soil degradation, the decreasing scale of irrigation and drainage projects, deteriorating environmental aspects of agribusiness;
- poor training systems;
- the absence of an efficient distribution chain;
- production decline in the private cattlebreeding due to reductions in the number of livestock and poultry; livestock farming is mostly unprofitable because of the disparity in prices and the chronic shortage of fodder;

- the state procurement system is disintegrating without being yet substituted by private networks; the degree of monopolization is greater at the procurement level than at the retail market;
- the decline in the Russian economy is reflected above all in dwindling state and private investments in the agricultural sector; foreign investments are still negligible; the production capacities are decreasing as a consequence of fixed assets wearing out and of the paralyzed investment activity;
- the lack of money for repairing all kinds of agricultural machinery; difficulties in obtaining bank credits (especially long-term credits).

The declining food-processing industry

There have been 3,962 food-processing enterprises in the Russian Federation. As of February 8, 1993, 2,000 of them have been privatized. Food-processing companies have preferred the so-called second variant of privatization, which implies redeeming a controlling stake and - under the given conditions - retaining of monopolies. Food processing is running below full production capacity; for the shortage of raw materials the production of meat, full-cream milk, margarine, potato products, bread and pasta, of mineral water, tea, salt and other products is decreasing; the output of almost all cereal-based dry products for infants has been almost terminated.

In the food-processing industry, production continues to decline not only because of decreasing deliveries from the national agricultural suppliers and the decreasing Russia's import. The current payments crisis is another factor responsible for the deterioration of the situation in this industry; the acute shortage of hard currency does not allow the industry to replace worn-out equipment.

A greater stratification of the society

The Russia's President says: "I feel people's patience has been exhausted. For two years, they have been tightening their belts. Now it is time to show results" (see the International Herald Tribune, December 23, 1993, p. 6).

The following data shed some light on a growing polarization of the society:

The ratios of the maximal income decile to the minimal income decile

	1991	1.07.1992	31.12.1992	1.04.1993
Official estimates	5.4	6.5	7.5 - 8	9.6
Experts' estimates				50

Note: The factor of 50 is typical for some industrially underdeveloped countries at the capitalism periphery (cf. the present ratios for the USA - 14, Germany - 7, China - 3).

Sources: Vek, 1993, No. 41, p. 7, No. 49, p. 5.

Judging by consumption level, Russia is thrown at least 10-20 years back. The majority of families cannot afford themselves non-food purchases. The 5-10 % of Russian population was in dispose of 80 % of all ruble savings in 1992. In the Spring 1993 more than a half of Russian population had per capita income less than the socially necessary minimum (1992 - 30%), the 14 % of the population - less than physiological minimum (1992 - 5%). According to independent experts, the income of 80% of the population during 1992 - 1993 dropped 2.5 - 5-fold (according to the official estimates, the factor is substantially lesser - 1.3 - 1.43). High income groups are buying luxury consumer goods and/or transferring their capital abroad. For the first time after the World War II the death-rate exceeded the birth-rate in 1992. Low-income brackets can't afford even the necessities (see BWW, 1993, No. 40, p. 4).

The official unemployment rate in Russia is 1% (the ratio of the officially registerred unemployed persons to the economically active population). The ratio of all fully unemployed persons to the economically active population is 5% at present, partial unemployment - 5.4%, total unemployment - 10.4% (see Izvestia, December 21, 1993, p. 2). The middle class is hardly forming whereas the underclass (pauperized people) is forming an important unintegrated segment of the population.

These and other similar facts have sowed doubts in the benign quality of the administration and have been effectively used by the opposition at the last parliamentary election in December 1993.

The low efficiency of the economy

Russia is endowed with the substantial economic and technological potential which has not been properly used. The country has a narrowing scope of competitive leads, mainly in the extractive industries, in traditional handicrafts and in a few high-tech industries (modern armaments, air/space and atomic equipment, scientific instruments, dressing of uranium and other ores, and other). Sharply focused capital advancing and well-elaborated international co-operation in these industries could provide relatively high export revenues and profits.

Yet the whole technological system is morally and physically obsolete. According to the Head of Russia's Union of Industrialists and Entrepreneurs Mr A. Volsky, only 16% of Russia's production capacities (mainly in the production of modern weaponry and in the space industry) could be able to bear international competition if the Russia would completely open itself to the world markets, but 28% of enterprises would be inevitably bankrupt (see Frankfurter Allgemeine Zeitung, 16.11.92, p. 1). This huge gap in techno-economic efficiency explains demands for protection and increased import tariffs.

Economists calculated that "per unit of GDP, Russia used 15 times as much steel, nine times as much rubber and six times as much energy as the USA. Comparisons with Germany and Japan are even more depressing". "If all the raw materials that Russia

produces were sold abroad, the country would earn twice as much as its present total GDP. (The figures, using exchange rates and output estimates of September 1992, are 27 trillion ruble for raw materials and 15 trillion ruble for GDP.) Yet raw-material output is included in GDP. If GDP is lower, it must mean Russian industry is subtracting, not adding, value to the raw materials it consumes. By this (admittedly inadequate) measure, Russia would be better off if every industrial worker stopped working. One recent study estimates that 8% of Russia's current industrial output is produced by value-sub tractors, and that 35% would be unprofitable on any realistic measure of labour and capital costs. Reform, therefore, ought to cause slump - i.e., ought to drive inefficient firms out of business so resources can be put to better use" (Parker, 1992: 10).

The above reasoning is an example of a not quite correct conclusion from a realistic logical premise because closing of inefficient firms does not necessarily imply slump. Moreover, the attempt to raise efficiency via the slump notably failed in Russia where interruptions of production have not spared both of groups including, respectively, inefficient and efficient enterprises.

Unlike declining industries in the West that usually post a measured growth of labour productivity as a consequence of closing of unprofitable enterprises (still usually lower than the growth of labour productivity in expanding industries, see for details Ryzhenkov 1989), the decline of Russia's industry manifests itself in a drop of labour productivity, in growth of material and energy intensity (inputs per unit of output)[8]. The above facts are crying for a necessary transition to a new technological system, but the inconsistent economic reform delays solving this fundamental problem. "The liberalization of prices and tariffs has failed to create competitiveness. The Government made free prices the core of its policy, but this policy is inefficient in the monopolized economy", - a Russian weekly writes in an editorial article (BWW, 1993, No. 45, p.2). The rigid stabilization policy pursued by the Russian government was one of the reasons for the decline of industrial output and national income (BWW, 1993, No. 40, p. 2).

4. A hypothetical underlying structure of the deindustrialization

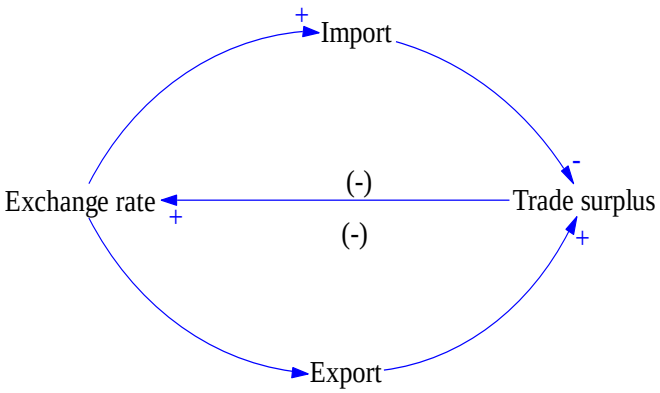
The facts from the previous section reflect the fundamental technological disequilibrium in the global economy that is the underlying reason for the gaps between the living standards in the OECD-countries and in the CIS. This disequilibrium brings about, often in a round-about way, the politico-economic uncertainty/instability in Russia and the CIS as a whole. The growing discrepancy with the world technological frontier takes off the factor-oriented cost advantages and makes output morally obsolete and unsatisfactory for consumers. This observation is the starting-point for further reasoning.

I believe that total production cost per unit of a socially acceptable output in Russian manufacturing industry are usually higher than internationally socially necessary: an

efficiency of any indigenous firm is heavily depreciated by the general low technological level and poor infrastructure in spite of low labour and energy cost. This discrepancy and the distorted structure of the internal prices in relation to the international one transforms incentives for an entrepreneur to invest in manufacturing on the Russian territory in their opposite - to disinvest, to consume or to convert value in trading/interest-bearing capital at home or abroad. This still dominate tendency undermines the very base of social cohesion and consensus. The unstable politico-economic situation raises the private interest in a short-term profit.

Comparing future returns and probable costs is a usual procedure of an investment projects evaluation. According to estimates of Mr Jury Skokov, the Chair of the Federation of Russia's Commodity Producers and former head of Russia's security council, the average profit rates in the spheres of circulation and production have been 600-700 and 20 per cent, respectively (see Frankfurter Allgemeine Zeitung, 17.7.1993, p.10). We think that institutionally and structurally unprepared opening of the Russia's economy to the rest of the world at the beginning of 1992 caused the higher economic and social cost of the transformation that the objectively necessary. The big bang theorists built their recommendations on the self-balancing mechanism of exchange rates and trade surpluses (see Figure 1). Still other important relationships did not receive a sufficient attention.

Figure 1: The foreign trade balancing feedback.



Note: Here and on similar figures below the symbol "+" means that a change of a variable is enhanced by an increment in another variable, the symbol "-" means that a change of a variable is negatively affected by an increment in another variable.

The development has confirmed a brilliant forecast of Professor G. Anulova: "Unsound erratic demand for foreign currency and imported goods, "flight" from the ruble, sharp fall of its exchange rate to the black market level, or even below that, because of the "overshooting", a manifold rise in the prices of imported goods in the domestic markets, a corresponding increase of the general level of domestic prices, skyrocketing inflation, up to several thousand per cent per annum; abrupt disruption of internal links, chaos in the economy: mass unemployment...; growing danger of depredation of natural resources because of the rush to export everything that can be sold in the West;

growing social tensions" (G. Anulova, Unpublished paper on ruble convertibility, 1990, p. 26. This quotation is from (Bortolani, 1993)).

The detrimental effects of the unsound economic strategy and of expectations of a further ruble devaluation are reflected in Figures 2 and 3.

Figure 2: Detrimental effects of inflation on the exchange rate.

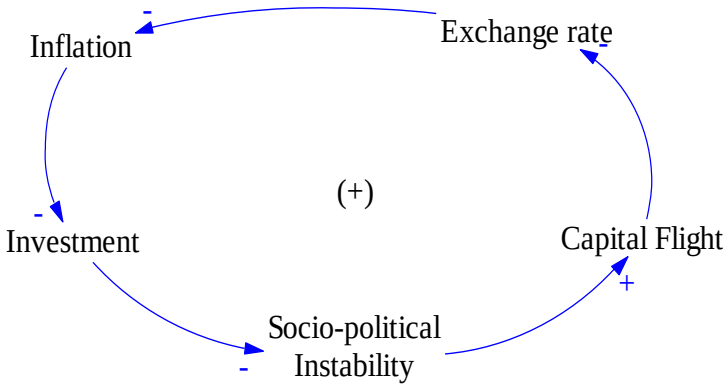
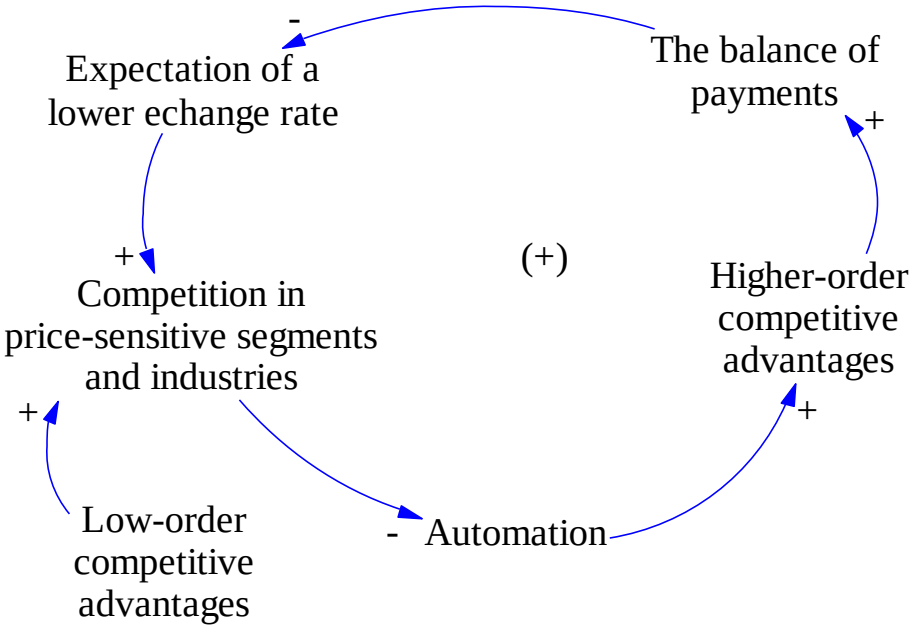


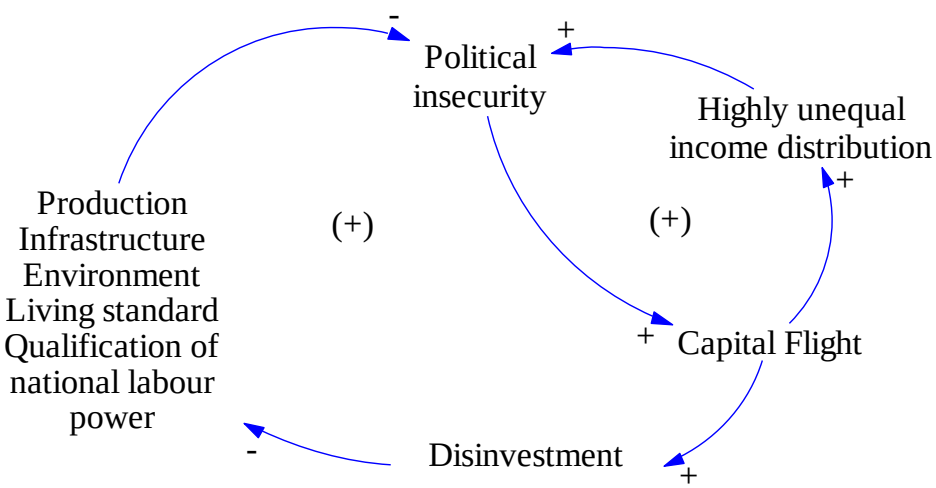
Figure 3: Self-fulfilling prophecy of a weaker national currency and of national industrial decay (based on Porter, 1991: 641-642).



We think that Professor D. Lipton and Professor J. Sachs treat convertibility in too restrictive way when they claim that "convertibility is a macroeconomic (monetary) phenomenon, and not a structural problem related to the competitiveness of the export industry or the import-competing industry" (Lipton and Sachs, 1990: 26).

Capital flight is a symptom of disfunctional economy. Russia desperately needs the capital that is now fleeing. There are strong vested interests of some exporters, commercial banks, central/local bureaucrats, and of the mafia to preserve the present situation (which they find very healthy). The relative and absolute deteriorating of the living standard of the majority of Russia's population explains the absence of consensus concerning the content/direction and pace of the transformation. This politico-economic instability, induced by inequality, is making weaker trust and certainty about property rights, contributing to capital flight that enhancing instability and inequality further. Social policies that increase inequalities would have very damaging effects.

Figure 4: Investment and political security spiralling downward.



The high degree of monopolism, low elasticity of commodity and capital flows against price, budget deficit, devaluation of the national currency are most important immediate factors of the inflation. Saying more generally, Russia's technological system is providing conditions for sellers' market instead of buyers' market, hence steadily growing prices. Because of the chronical shortage of the means of circulation and payment, typical for periods of hyperinflation, many production units are delaying or are not paying wages and salaries to employees for months (hence strikes and hunger-strikes).

Whereas inflation contributes to unequal distribution of income, it promotes inflation, in its turn. "Inflation may be expected to be lower in economies with more equal income distribution (other things equal) due to lower pressure for government expenditures, and lower presser in wage bargaining... the more equal the income distribution, the more the state can pursue developmental goals rather than distributional goals..." (Amsden 1993: 18).

The continuation of the present pathological situation would require pumping of consumer goods from the West in exchange for raw materials and fuels from Russia under worsening ecological conditions and with a high likelihood of wars, ecological/nuclear catastrophes.

Figure 5 provides us with a fragmentary logical scheme (some important reinforcing/balancing feedbacks and delays are not shown).

Figure 5: The vicious circle of declining investment and (hyper-)inflation.

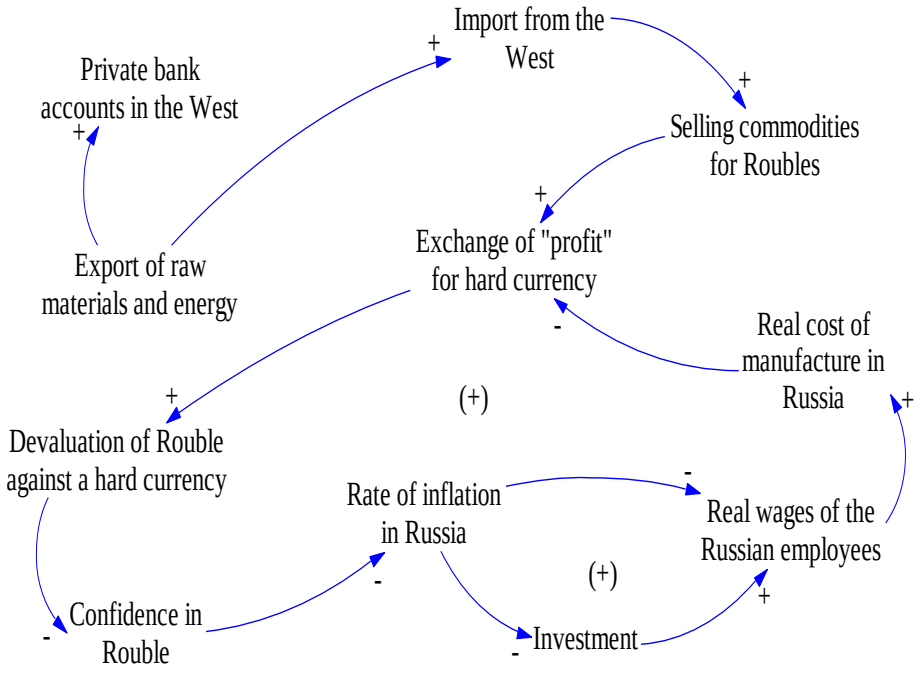


Figure 5 demonstrates that individual rationality does not imply collective rationality. The contradiction between individual and social interests, typical for a market economy, has achieved a very acute degree. This vicious circle, containing seeds of its own destruction, should be converted to a virtuous circle of expanded reproduction (the negative influence of the declining investment on the production of fuel and raw materials as well as on the competitiveness of the Russian economy is not shown explicitly). The total gains of partners in the West and in the East would be raised and sustained, the social climate would be substantially improved.

The attempt to introduce autarky will fail without sufficient internal production and without serious public support, whereas a "clever" protectionism and gradual liberalization (if necessary conditions have been provided) seem to be more acceptable. This moderate protectionism would not be very detrimental toward foreign partners interested in long-term benefits.

The negative tendencies to broadening the socio-economic crisis, building a criminal-monopoly market, swelling and burocratization of the state, increasing social inequality, destitution of a considerable part of population were stronger than positive tendencies. The above vicious circles are not running completely unchecked as the government and the Central Bank have been taking active steps to control and halt the negative tendencies. The possible options of the state policy range from
- providing the positive real interest rate (it has been achieved in December 1993),

- introducing a more restricted regime of foreign trade with a harder state control over export revenues
to
- collecting the rent from the exploitation of the natural resources via taxes for investing in socially prior projects,
- monopolizing the raw material and energy export by the state.
One can easily predict that this matter will be in the centre of polemics in the newly elected Federal Assembly. We will return to this problem below in the Section 7.

5. The heuristics of the Prisoner's Dilemma Game

The CIS was/is conceived by many politicians and experts as a transitional short-run form to a new socio-economic and political constellation of newly born sovereign states (no longer a system but a set of independent, "divorced", units). Until recently this (mis)understanding began to acquire features of the self-fulfilling prophecy (see Figure 6).

The new states found themselves under conditions similar to those of the well-known non-iterative Prisoner's Dilemma Game, where defective (non-cooperative) strategy seems to be the mostly rational (dominant) for both players whose potential total gain could be greater if they had cooperated (see Table 9).

The mutual defection was, for example, clear in attempts to draw Western assistance and Western attention or to shift a burden of the run-away inflation on shoulders of neighbours (see Figure 7). One remaining problem was a control of the money supply by 15 countries, with 15 central banks, using the same currency - the ruble. "Animosities among the nations have prevented them from creating a cooperative mechanism" (The International Herald Tribune, 8.06.92, p. 3).

Figure 6: The self-fulfilling prophecy of the CIS disintegration.

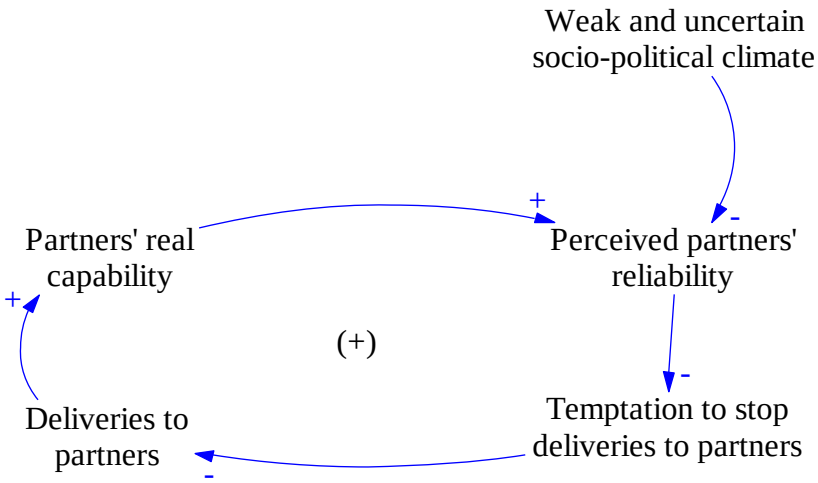
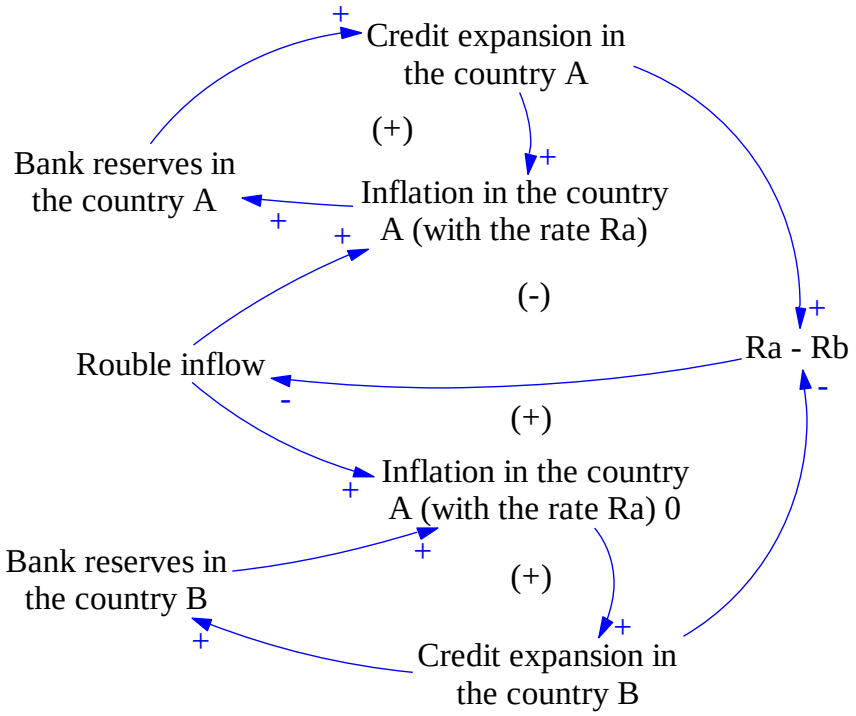


Figure 7: The inflation in neighbour countries of the ruble zone, viewed as feedback loops interaction.



Note: This scheme explains amplifying and balancing of the inflation rates (price levels at the initial situation were approximately the same). If $R_a < R_b$ then money flow from country B into country A thus accelerating inflation there as it is more profitable to buy in this country. The symptomatic solution is a protection of an internal market. The fundamental solution calls for a greater monetary (self-)discipline and better co-ordination of central banks' policies in these countries.

The above short-sighted strategy ignored both the recurrent nature of economic relations and their spatial context. It resulted in the negative-sum-game, in a vicious circle where bad leads to worse. The ruling elites of some states especially at the very beginning of their political independence resembled agents playing *against* each other instead of playing *with* each other. Whereas the second approach assumes searching for co-operative strategies, the first one almost excludes them.

The game theory provide us with the conditions necessary for a genesis and stability of voluntary co-operating in a system of agents ("egoists") interacting with each other in totally decentralized way without coercion. We restrict ourselves with some implications of an analysis of the recurrent Prisoner's Dilemma Game for N persons (i = 1,...N, N > 1), where an optimal strategy of each player depends upon strategies of all other players and where a history of previous interactions, an agent's reputation are, usually, also important (see Axelrod, 1991). A time horizon of interactions is not given in advance. The discount coefficient w (0 < w < 1) balances a prompt payment against a greater payment at a later date.

Then two equivalent conditions of a collectively stable co-operative strategy may be written as

$w > (T^*_i - R^*_i)/(T^*_i - P^*_i)$ and/or

$(1 - w)/w < (R^*_i - P^*_i)/(T^*_i - R^*_i)$, where

T^*_i - a payoff for successful one-sided defecting (temptation),

R^*_i - a reward for mutual co-operation,

P^*_i - a punishment by mutual defecting.

A high probability of future interactions within the group (reflected by the parameter w), relatively low costs of co-operation compared with costs of conflict, relatively strong interdependence promote co-operation (see for details Axelrod, 1991). Thus, the stronger future overshadows present and the stronger incentives to mutual co-operation are compared with temptation to defection, the higher is the likelihood of emergence of co-operation and its stability. The co-operation cannot emerge in a system by on a single player's initiative if the other is (are) permanently defecting. Still co-operation can emerge under definite conditions as a dominant strategy if a cluster of co-operating agents invades a population of defectors because of a higher fitness of the former.

A long-term attitude, equality, reciprocity (granting of mutual advantages), self-restraint, better understanding of the very fact that success of partners is, at least partially, a precondition of own success may strengthen robustness of the collectively stable strategy. The players can even escape from the paradox of the Prisoner's Dilemma via changing the payment matrix ($T < R$ and $P < S$ instead of $R > T$ and $S > P$, initially), and/or via permitting interdependent decisions, imposing a tax on defecting, introducing agreements and centralized common structures (including juridical, legislative and administrative institutions), like in the European Community.

The shortcomings of the non-cooperative strategy among the countries of the former USSR revealed itself when an environment for a country's own development had deteriorated as its consequence of this strategy. The sharpening economic crisis made the cost of conflict so high compared with the cost of co-operation that all the successor republics, with the exception of the Baltics states, have formally (re)joined the CIS. The Ashkhabad summit has enforced their Economic Union, which declared to be open for other potential members. Yet the restoration of distorted relationships is far from being finished.

The other very important conclusion from the heuristics of the Prisoner's Dilemma Game is the importance of consciousness: a time-consuming evolution of co-operation may be accelerated by the foresight ability. Political leaders may prudently minimize (or even avoid) a usage of the expensive trial-and-error method and exclude non-co-operative policies at all. One should not forget that the rational behaviour of an agent in the recurrent Prisoner's Dilemma Game may presuppose retaliatory measures in response to defection at some day (a limited provokingness). Cost of

mutual punishments may be very high in protracted conflicts, like in Transcaucasia. Forming public opinion in favour of long-term co-operation will also contribute to its viability. A high quality of leadership, sharing of responsibilities, cohesion and consensus are necessary if the CIS states are to be unified by more than name only. The deeply embedded reciprocal practices of the traditional pre-Soviet and Soviet economic systems may be also utilized.

Kazakhstan's President N. Nazarbaev has expressed the ideas of a CIS common parliament and of a gradual creation of a CIS common government (on the basis of the consulting-coordinating comittee) as well as suggested a rapprochement of the countries' legislation (see Nezavisimaya Gazeta, 1994, January 6, p. 3). Our analysis above is evidently in line with these valuable suggestions.

6. Experimental results

The recent developments in the CIS were partially anticipated in 1989-1991 in laboratory experiments carried out at the Novosibirsk State University. A reference model (Valtukh, Pusep, 1988) explicitly mimics some important interconnections between technological and socio-economical sides of the capitalist mode of production and provides a framework for gaming. These experiments woven through the educational process helped students to grasp the necessity of public control over reproduction, based on uncovered economic tendencies, social priorities of efficiency and equity.

Participants of the gaming experiments ("entrepreneurs") unexperienced in the functioning of a modelling capitalist economy did not accomplish effective economic growth. A deficiency of resources and /or low profitability was the immediate reason behind firms closing. Partial closing of business was preferred to whole closing of firms. Inter-sectoral and intra-sectoral capital flows were directed by profitability.

Despite these signs of rationality, the behaviour was only limitedly rational: even under a strict budget constraint ineffective firms and technologies attracted a substantial share of all investments, the production was very prodigal with its human and material resources, and there were severe economic crises and mass unemployment. The viable technical change was retrogressive (direct and total inputs of labour per unit of output were increasing). The experiments illustrated the positive dependence of real wages on accumulation of capital (disinvesting resulted in a dramatic decline of employees' living standard). The "invisible hand" did not help our aggressive and short-sighted players to utilize the economic potential. Thus, the indisputable importance of the rigid budget constraint for efficiency and effectiveness of a market economy is overemphasized and not properly subordinated by big bang theorists, who have built their concept of a transition strategy on fast overcoming soft budget constraints and other similar shortages of Soviet-like economies.

More experienced players modified not only strategies but very norms of behaviour transiting from single-loop to double-loop learning (cf. Argyris, Schön, 1978: 18-29). (In reality, the transformation of behavioural norms usually implies power shifts and

requires a new institutional structure. A strong resistance of mighty groups can delay for a long time the necessary reforms.) Social and individual interests draw together consequently, the production was extended (Ryzhenkov, 1990, 1993).

Players learnt that whereas a capitalist firm chooses typically that technique which maximises profitability, the society is interested in that which requires a minimum imput of labor. They removed from production technologies that were not effective ones judging by both criteria and invested more frequently in socially effective technologies. In order to overcome an economic crisis players ("entrepreneurs") went through a Schumpeterian creative destruction (closing inefficient firms and opening efficient ones), stimulated consumer demand (wages were paid even to a substantial share of technologically excessive workers) and co-ordinated in advance their investment, production, selling and buying decisions. The decision-making was, in fact, substantially centralized. The vicious circle of downsizing, economic contraction and still more downsizing, typical for the decline phase, was turned around.

The degree of co-operation was determined endogenously and was higher than among unexperienced players. This new deal, like the New Deal of the Roosevelt Government, helped participants to pull model economy out of the crisis. It was shown that output and employment are more easily maintained if strategical decisions are centralized and that capital is attracted by growing markets. Russia's troublesome economic development makes this findings and conclusions even more relevant.

Players not only reveal information embodied in the initial conditions and rules of the game, but also create/store new (synergetic) information via decision-making. In particular, they keep in mind the choices of techniques, by giving preference to the definite connections between different technologies among a broader set of possibilities, and develop new behavioural algorithms, thus raising the functional efficiency. In addition, collective learning and teaching provide a new semantic level of information. The key organisational feature of the economy in the information age, namely complementarity of competition, co-operation and co-ordination, becomes notably visual. The big bang theorists underestimate the importance of these factors for the social transformation.

The progressive evolution accelerates if players are provided with additional information (for example, by teaching). Social change as a result of a learning process does seem to occur in societies. Professor J. G. Miller writes: "Nations undergoing development now do not pass through all the evolutionary stages by which more advanced societies reached their present stages of development. Instead, they telescope the processes that originally took centuries into a few years of profound alteration of structure and process" (Miller, 1978: 860). The CIS can profitably learn not only from their own experience but also from experiences of the Western Europe, the NIE and of the other countries (see Section 7).

The experiments give support to the idea of a self-organization tendency inside a market economy but clearly not in the textbook neoclassical way. They had shown, in

particular, that a monopolized market economy could not automatically overcome a deep economic crisis and is not immune from self-destruction; irrationality or myopic rationality at a local level could produce collective irrationality if some critical positive feedbacks (vicious circles) run unchecked. I agree with Professor R. Wade that the confidence with which the neoclassical school prescribes liberalization and privatization cannot be grounded, for this school has a scarcely developed theory showing how liberalization and privatization generate growth (see Wade 1990: 348). The experiments support conclusions derived from the heuristics of the Prisoner's Dilemma Game and provide us with some new useful insights for the policy recommendations.

7. A rational therapy policy

The negative economic tendencies of the former USSR have been amplified in Russia and other republics because of a shock therapy policy. Professor K. Valtukh and his colleagues from the Institute of Economics and Organization of Industrial Production, the Siberian Branch of Russia' s Academy of Science, have shown that a path towards economic recovery is very stern and steep (see Table 10). Their optimistic scenario envisages reviving investment (their level of 1990 could be attained in 1995 again) for
- the restoration of the economic potential of the year 1990 to the year 2000,
- stronger environmental protecting and
- conversion of the military production.
The private consumption could be raised to almost 80 % of the pre-critical level (i.e., of the year 1990) in the year 2000 (62.3 % of this level in 1995).

The elaboration and implementation of the mobilizing strategy, based on an increase of the rate of surplus labour and on technological advance, appear to be the only possible escape from an imminent catastrophe. A strategical reorientation towards the fundamental evolution factors could be a prerequisite of a socially efficient privatization (cf. Valtukh, 1992).

The Siberian economists argue that the above macro-economic forecast is based on tactical and strategical requirements, in particularly:

- arranging economic connections destroyed in the last years,
- resuming interrupted production,
- mobilizing food resources for the non-agricultural population,
- initiating first steps in reconstruction of the national economy;
- mobilizing - very limited - resources for technical renovation and extension of production capacities of the investment sector,
- creating new branches in this sector,
- beginning the general technological reconstruction,
- creating minimal necessary conditions for substantial socio-economic reforms and handling social problems,
- building an efficient administration capable for centralized guidance of technological transformation,

- creating technological system that guarantees buyers' market,
- privatizing the main part of the economy and liberalizing prices (see Valtukh, 1993).

We have seen that Russia's draws its competitive advantages mainly from such factors as the abundant natural resources, low cost labour and the devaluated currency. Experience teaches us that this strategy is the poor base for satisfying social needs and vulnerable to challenges by other nations. It is also detrimental to the environment. Under the present conditions, this strategy may be used only as a symptomatic solution of the immediate problems for gaining time and resources for a fundamental solution via investment/innovation oriented strategies.

Still some economists defend this strategy. "The main point is the country's deindustrialization. The industry is more and more heeling over the raw materials, but this does not testifies its degradation. Rather, it is possible to speak about greater conformity of the home production with our relative competitive advantages in the world economy" (Russia's economy in 1993. Moscow, The Higher School of International Business, 1993, p.10, in Russian). We agree with Professor M. Porter that policies "that convey static, short-term cost advantages but that unconsciously undermine innovation and dynamism represent the most common and most profound error in government policy toward industry" (Porter, 1991: 621).

A transition from the basic factor-driven stage to the investment/innovation-driven stages of socio-economic development is not to be taken for granted at least without a basic reorientation of the society toward the fundamental evolutionary factors. The scientific-technical progress should become the core of management and controlling at macro- and micro-levels of the national economy. Otherwise, instead of overall modernization under national control, "enclaves" of capitalist penetration would emerge. Foreign investment would most likely be concentrated in the extraction of raw materials, such as natural gas, petroleum, and gold, rather than being broadly invested through the post-Soviet economies. "Moreover, by reverting to a focus on raw materials and labour-intensive products, it would squander the heavy investment already made in scientists, engineers, and skilled labour" (Elliot, Dowlah: 532). It is essential to develop dynamic competitiveness based on technological innovation. Consequently, it will be necessary to support and further develop the existing technological know-how.

The concept of developmental state provides us with some other necessary conditions for the effective governance: a politically secure government, accepted as legitimate; professional, competent and prestigious administration; continuity in governmental officials; state's autonomy vs business (see Amsden, 1993). A developmental state co-operates with business and disciplines business; it invents and builds an environment that supplements competition by institutions of co-operation and co-ordination; the developmental state grants property rights, certainty of the legal framework and legal structures compelling the obligations of ownership to be discharged.

For coping with the challenges of the information age patterns of behaviour and policies should adapt themselves to the global, dynamic and probabilistic nature of the scientific-technical progress (scientific-technical and educational cycles stretch over continents/countries and centuries/decades; investment in visible and invisible assets become more and more expensive and are risky, etc.). Long-term steady capital intensity and productivity growth is the only solid foundation for well-being of the present and future generations that fosters, in its turn, the capital accumulation and technological progress (see for details Ryzhenkov, 1993).

Russia's state should provide a general production and market guidence towards high-tech-high-wage economy. The First Vice-Premier of Russia's Government expressed his opinion on the necessary orientation of the Russia's economic policy: "Currently, Russia's renowned assets, such as its vast terrain and rich natural resources, are not vital to economic success. More crucial are Russia 's knowledge and scientific achievements and the transformation of these accomplishments into state-of-the-art technologies and products...The government must design an efficient industrial policy with several priority areas. First of all, the development of advanced technologies...and the efficient introduction of inventions and discoveries into production...The Government must also help disseminate technical knowledge" (Soskovets).

The state can promote investment/saving within the national territory via:

- reducing uncertainty by setting national priorities, developing long-term programmes and plans for the national and regional economies, striving for sharing of a common vision by the economically active population;
- subordinating mercantile and money trading capital to industrial capital,
- socializing risk attached to long-term investment (for example, freeing from taxes profit allocated for investing and for R&D);
- investing in fixed assets, infrastructure, human capital, R&D;
- steering allocation of the scarce economic surplus by firms towards socially effective projects;
- arranging finance and investment through taxes, via new banking institutions, emerging under the governmental control and with the state capital sharing.

The participants of the Schwerin International Colloquium have declared: "The state cannot decline responsibility for the consequences of the transformation process referring to the functioning of the market forces. It is thus the major importance to achieve a balance between the dismantling of inefficient structures on the one hand and the creation of political, economic and social prerequisites necessary to mobilize existing developing capacities on the other hand. This goes beyond a mere cushioning of the social effects of structural adjustment and includes an active industrial policy" (SEF: 265-268).

Still according to Professor Livshits, the deputy head of the Analitical centre of the President administration, the Russia's Government has not yet developed a concept of an effective industrial policy. On his opinion, its development will be one of the most

important tasks of the Federal Assembly elected in December 1993 (Nezavisimaya Gazeta, 23.12.93, p. 4). During the "great depression" of the 1990-s, the relationship between some of the ways in which the economy has been managed and a disastrous outcome have appeared to be abundantly evident. One may expect that policies and platforms of major political parties will reflect these associations, and changes will be made in relevant laws and organisational structures.

The state is to bring up capital that is able to wait for gains for a long time. Unless patient capital is not brought up and capital market is not effectively operated, the state together with its banking institutions should carry out all the necessary policies and strategical decisions and should set values of the main control parameters (the exchange and interest rates, a general price level) essentially determining development and functioning of the national economy.

The state can consolidate national entrepreneurship and achieve a synergy effect by facilitating financial-industrial groups, based on relatively closed technological chains and/or united by a common production goal. The Japanese *keiretsu* appears to be the most suitable organizational form for such groups. One organization that could give hints of Russia's industrial future is a company called Rossshelf. The consortium includes Gasprom, the state natural gas monopoly, and a nuclear submarine shipyard. It won a deal in developing a vast natural-gas field under the deep and frigid water of the Barents Sea. The venture was modelled on a *keiretsu* (see International Business Week, October 18, 1993, p. 22). Other financial-industrial groups are to be organized as well. The development of small and medium-scale enterprises (especially of technologically oriented venture capital) is to be promoted too. The state ought to foster different forms of corporatism (chambers and associations of industrialists, producers' and consumers' unions, parity commissions, etc.).

A bank-based financial system is to be able to sustain a high debt/equity ratio under the close government control. This system should be properly designed in order to prevent chain reactions of bankruptcies and insolvency. A two-tier banking and interest rate system ought to provide a relatively high interest rate for savings and credits (positive in the real terms) and a relatively low interest rate for loans allocated to debtors with assigned priority - the difference is to be covered by state subsidies. Creating a stable monetary environment, a positive real interest rate for savings and credits, a sensible system of taxes and trade regulations will stop capital flight and money will probably return in Russia from abroad.

Nurturing the development of private sector initiative under reliable legal and economic conditions, approaching sectors and branches on a selective, regularly revised basis, the state has to protect major industries, particularly, offering preferential loans to infant export industries, initiating restructuring of ailing or declining industries, ceasing state intervention in industries, prepared with the help of Western technology transfers to compete. I agree with the thesis that " a real catching-up process can only be achieved through acquiring the capacity for participating in generation and improvement of technologies as opposed to the simple "use" of them" (Perez and Soete).

The developmental state will emphasize import of foreign technology together with its adaptation and improvement, limiting the degree of foreign participation in key industrial sectors; ensuring the compatibility of such investment with national programmes and plans; on the other hand, the state will provide export credits and assist Russian companies to win large contracts. A sophisticated system of import restrictions, domestic content requirements, foreign exchange controls, conditions on the admission of foreign investment, export incentives, technology incentives, and the like should be carefully elaborated and effectively applied. It should be transparent for a social control.

The state should avoid overreliance on devaluation of the national currency (ruble). The post-war history shows, that such a reliance rarely leads to long-term productivity growth, but often deteriorates a nation's living standard. National firms expecting a lower exchange rate prefer price-sensitive segments and industries and neglect automation and other form of technological progress, induced by a high labour bill share in value added (see Section 4 above).

We have seen that the speedy reform of the foreign economic relations has contributed to the macroeconomic destabilization: in particularly, the weaker control of foreign transactions on the microeconomic level led to the growth of the foreign debt, to capital flight and to the foreign trade structure which is even worse than the initial.

We agree with Professor Bortolani, that the path towards convertibility is rather complex and is not to be accomplished in the short term. "...attempts to force the objective of convertibility in the framework of the so-called shock therapies are doomed to failure". "...the great majority of nations in the world owns, still today, currencies which are more or less inconvertible for a series of reasons...various western countries, on a market basis, have taken two or three decades before the current situation of great currency liberalization for residents and non-residents" (Bortolani, 1993: 25-26).

Professor Urban makes another valuable observation: "Neither Korea nor Taiwan used undervaluation of their currencies to promote export...Under the existing system of import controls their currencies were actually overvalued compared with a free trade regime. Such a policy brings down the prices for imports relative to exports and could be appropriate for the East European countries if the import content of exports was yet high and if exporters were compensated by export subsidies for their losses in international competitiveness, due to the hard-currency policy" (Urban, 1992: 58). It appears to be necessarily to restrict internal convertibility until ruble has become much harder.

The controversial question of the current economic policy is whether the state should raise taxes and dampen inflation by sharply cutting subsidies to failing industries and farms and to consumers or whether it should avoid such a drastic measure in view of its detrimental effects on already declining production, factory employment and living standards.

The shock of sharp cutbacks in the budget deficit and in subsidies to farms and factories was unsuccessfully tried in early 1992. It has not worked - and will not. The pumping of money from the state budget into the private and public sectors has deprived social and ecological programs. Until the sustainable growth of production has been achieved there should be no attempts to draft a state budget without deficit; an attempt to balance the budget under the conditions of the economic decline brings about hyperinflation. So the key issue is the rate at which the budget deficit can be cut by controlling the rate of growth of the money supply together with other measures. The developmental state should carefully elaborate social/ecological programs and carry them out.

The experience of the NIE may be helpful again. Professor Amsden points out: "...fast-growing late industrilizers, as epitomized by Korea and Taiwan, have generally succeeded in disciplining subsidy recipients, imposing strict and monitorable performance standard on them" (Amsden, 1993: 26). In East Asia, subsidies have tended to be allocated according to principle of reciprocity, in exchange for concrete performance standards that have been monitored by a capable bereaucracy. This approach is appropriate for implementing in the CIS too.

Without a substantial contribution from the West, the difficult task of evolutionary stabilisation and development could hardly be fulfilled. Our analysis speaks in favour of a massive transfer of knowledge from the more developed countries to the CIS, especially in the forms stimulating voluntary learning, in order to change the pathological patterns of behaviour, indicated above. Financial, technological and humanitarian help by the West can extend resources available to the CIS and to a certain extent lessen its stress.

The following elements appear to be particularly important for an overall concept of efficient co-ordination of Western aid with the assistance of the recipients, especially in the light of the experiences made in the Third World:
- debt relief,
- improving safety of atomic power stations and plants[9)],
- better terms of trade,
- access to capital and know-how (technology transfer),
- tax breaks for certain industries, etc.

Economic relations with the West should be refocused from conventional trade transactions toward direct investment materialized in high-technology.

An access to the newest developments in technology should be provided for partners from the CIS under suitable charge. Recipients should participate in further development of technology, know-how and new products within the frame-work of long-term partnership. The mighty scientific potential of the former Soviet Union should be mobilized in forms that are more beneficial for its successors than the present "brain drain".

The international partnership should address the above bottlenecks (particularly in food distribution and storage), with special emphasis being placed on the efficient commercialisation/ privatization of the marketing, processing and distribution networks, using, where possible, the conversion of military production units. It may enhance upgrading of skills and development of the appropriate support infrastructure, including credit and banking facilities.

There are significant differences between approaches of the post-industrial societies, on the one hand, and of the CIS countries, poorly endowed with the energy resources, on the other hand, to Russia's energy price policy: the former are interested in abolition of its energy price subsidies, the latter - in preserving them[10]. In order to satisfy needs of its creditors (governments, financial institutions, etc.) Russia should increase the oil export share at the expense of the CIS internal industrial and personal consumption. The abolition of subsidies will lead to a further increase of the energy price and will reduce demand/consumption of oil within the CIS. The West is able by this and other way(s) to exert influence on integration of these countries and on the general process of their economic development. (This fact illustrates the dominance of flows of monetary information (via international networks of credit and banking institutions) over matter-energy flows in the world economy.)

Frieden ist nicht alles aber ohne Frieden ist alles nichts.
Egon Bahr

Conclusion

Medicines for the ill economy of the CIS cannot be perfectly prescribed by conceptions that rely on simple solutions (examples: "do remove the political restraint of a higher unemployment"; "abolish food and energy subsidies and close enterprises whose output is worth less than the cost of inputs" and you will get the budget balanced and inflation brought under control, etc.), because the consequences of some action proceed in far more complex dialectical way than it expected by simplistic conceptions or by so-called common sense. In this paper, I apply the concept of the closed loop of causal influences (see for details the book of Professor G. Richardson) and the heuristics of the Prisoner's Dilemma Game, which enable me to visualize complex social phenomena and advocate the rational therapy policy for tackling the complex social problems of the CIS.
This paper focuses on the declining investments, run-away inflation and other major pathological phenomena in the transformation processes in the Commonwealth of the Independent States. It is shown, based on the analysis of the actual development and on simulation/gaming experiments with a model of a capitalist economy, that the present vicious circle of inflation and declining investments (on the example of Russia) could be converted to a virtuous circle of growing investment and real incomes. A voluntary learning and massive transfer of knowledge from the more developed countries to the CIS may promote the favourable turn. Thus, this report offers a definite framework for understanding current events as well as for developing and testing long-term decisions and strategies. This framework is also used for policy recommendations.

In brief, overcoming deficiencies in the societal control and building consensus are necessary for shortening the terribly difficult path of the Commonwealth to the socio-economic recovery and rebirth. An active participation of the CIS in international frameworks (the United Nations, the Conference on Security and Co-operation in Europe, in particular) are of a prior importance too. The structural change and economic growth, development of the CIS own forms of organization and communication (the social cohesion, developmental state, investment/innovation orientation, production and market guidance, technological reconstruction, voluntary co-operation, advancing ability to learn and produce genuine novelty, technological catching-up) are the most essential premises for the evolutionary stabilization and integration of the Commonwealth of the Independent States in the long-run as well. The significance of these factors for the social transformation is underestimated by the big bang transition strategy and policy of shock therapy suggested for Soviet-like economies.

The sustainable development scenario with the long list of problems outlined in this paper seems improbable (cf. Van Zon, 1992). Yet the reference to the low probability cannot be a decisive argument against this scenario - for the emergence and progressive evolution of living systems appear to be a priory highly unlikely too. In order to make this scenario more real it is necessary to apply consciously socio-economic laws and regularities uncovered by the general living systems theory, thus upgrading the societal governance and converting the stress to the creative tension for the progressive social evolution.

Note 1.

Capitalism has not remained unchanged. The transformation of capitalism into what is often termed as the post-industrial society or modern mixed economy has played a very important role in the demise of Soviet-type societies. Professor J. K. Galbraith expressed an opinion that old age insurance, unemployment compensation, medical care, public housing, improved public services, the ending of the once-cruel exploitation of women and children, the minimum wage and effective trade unions have made capitalism an acceptable economic system (see The Guardian, November 25 , 1992, p. 3).

Note 2.

According to Professor B. Lavrovsky, production capacities in the industry were mainly stagnating or declining in 1974-1988 because of declining investment. These dynamics determined the delayed stagnation and decline of the USSR industrial production. The technical quality of fixed assets in the USSR was steadily deteriorating from the beginning of 1970-s (see Lavrovsky). The worn-out rate of equipment in Russian industry is, on the average, 50%, in oil processing industry - 85% (Pravda, 6.06.1992). (Cf. the worn-out rate of equipment in the Soviet industry: 1970 - 26, 1975 - 30, 1980 - 36, 1985 - 41, 1988 - 44 per cent.)

Note 3.

See Moskau News, Nr. 12, Dezember 1991, p. 12-13.

Note 4:

On some estimates, the "MIC" accounts for 20% of industrial employment and 20% of output in Russia (see Parker).

Note 5:

According to J . G. Miller, decider - policy-making council or assembly - may be downwardly dispersed to a variety of organizations, groups, or individual persons, including emperor, top executive officials, court, secretariat, or staff of a supranational system; artefacts such as palace, capitol, headquarters, administrative or court building; meeting room (see Miller, 1978: 915).

If living systems are integrated, they are centralized, the single decider of the system is exercising primary control. "If they are segregated, there are multiple deciders, each controlling a subsystem or component. The more integrated a system is, the more feedbacks, commands, and information relevant to making and implementing the central decisions flow among its parts. Therefore the more integrated a system is, the more one part is likely to influence or control another" (Miller, 1978: 39).

In the case of the CIS, the main decider component is the Counsel of heads of the states; there are also other subordinate components: the Counsel of prime ministers, the Defence Counsel, committees for foreign relations, for economy and finance, for social insurance, for internal relations, etc.

The CIS consists of a number of segregated states, so there are multiple deciders within each member country. (Cf. : The United States that was initially a supranational system whose central decider had only specified powers is now a society with a strong federal government and downwardly dispersed decider.)

Note 6.

"Russian imports [from other republics of the former USSR. - A. R.] fell 46% in 1991; the decline steepened in 1992. This had the same effect as supply disruptions within Russia" (Parker, 1992: 10). Russia's inability to stabilize ruble gave move to other republics to introduce their own currencies.

Note 7.

Soviet planners used to organize industry into 7 664 "product groups". Of these, 77% were produced by single firms, dispersed over the huge territory of the former USSR (see Parker).

Note 8.

The following illustration may be helpful. In spite of an energy price growth, input of energy per unit produced posted in 1992-1993 34 % increase. Whereas the GDP in 1992 was 20 % lower than in 1991, consumption of energy was only 4% lower. See Izvestiya, 1.9.93, p. 4.

Note 9.

"The Russia and Ukrainian nuclear power authorities are doing their best with limited resources to improve the safety of their Chernobyl-type RBMK reactors, and the older PWRs. But Western aid that was promised to bring older plants up to something like international safety standards has not materialised except on a small scale, and closing the plants down altogether is considered economically impossible" (Fairhall).

Note 10.

"Removing energy subsides in the ex-SU would be a major contribution to global efforts to reduce carbon emissions", - said Mr Lester Brown, director of the Worldwatch Institute (see Nasar). "Energy subsidies, economists say, are a prime example of misguided policies with large environmental as well as economic costs" (Ibid.).

Table 1 (Tabelle 1): Die Basiszahlen (1991).

	Bevölkerung (Millionen)	Einkommen (10^{12} dollar)	Durchschnitts-einkommen in dollar
Hoch (die hochent-wickelte Länder)	822	16,9	20570
Mittel	1401	3,5	2480
Niedrig	3127	1,1	350
Gesamt	5351	21,5	4010

Quelle: Die Weltbank. (See Keyfitz N. (1993) Bevölkerungswachstum verhindert die Entwicklung, die das Bevölkerungswachstum eindämmen könnte. Frankfurter Allgemeine Zeitung, 25. Oktober, S. 13.)

Table 2: The Republics of the former Soviet Union

	GDP (billion $) 1991	Est. GDP $ p.c.(PPP adj.) 1993	Population 1992	Territory (sq km)
Russia	642.35	2,750	149 000 000	17 075 400
Armenia	9.22	1,750	3 400 000	29 900
Azerbaijan	13.18	2,220	7 200 000	86 600
Belarus	42.12	2,900	10 300 000	207 700
Estonia	8.05	3,600	1 600 000	45 200
Georgia	13.81	1,400	5 600 000	69 500
Kazakhstan	45.11	3,800	17 100 000	2 717 000
Kyrgyzstan	8.80	2,100	4 600 000	198 500
Latvia	13.12	3,400	2 700 000	64 600
Lithuania	21.59	3,600	3 800 000	65 200
Moldova	13.09	2,300	4 500 000	33 700
Tajikistan	4.18	500	5 700 000	143 100
Turkmenistan	10.94	1,800	3 800 000	488 000
Ukraine	154.12	2,100	51 900 000	603 700
Uzbekistan	33.12	1,000	21 600 000	456 000

Source: The Wall Street Journal Europe Supplement. November 1993.

Key:
1991 - Nominal GDP at 1991 exchange rates (CIS ruble = 1.7$ official rate used)
1993 - Estimated Nominal GDP per capita adjusted for Purchasing Power Parity

Table 3: Inter-republican trade within the former USSR as the percentage of each republic's consumption and production (%).

	e_j/K_j	a_j/Q_j
Russia	7.7	7.3
Ukraine	12.9	12.6
Azerbaijan	15.6	25.4
Armenia	20-25	25.4
Kazakhstani	20-25	9.9
Kirgizstan	20-2	17.9
Moldova	20-25	21.2
Tajikistan	20-25	18.5
Turkmenistan	20-25	18.5
Uzbekistan	20-25	15.2
Belarus	20-25	23.4
Georgia	20-25	23.6
Latvia	20-25	20.3
Lithuania	20-25	23.0
Estonia	20-25	22.5

Source: Kommersant, September 23 - 30, 1991, No. 39, p. 27 - 28.

e_j - import, a_j - export (within the former USSR),

K_j - consumption, Q_j - production in republic j of the former USSR (j = 1,...,15).

Table 4: Cash deliveries in the countries, members of ruble zone, and cash emittance in Russia (per capita) in 1993

Republics	Thousand ruble	As the percentage to the Russia's level
Russia	29.3	100.0
Turkmenistan	54.7-61.9	186.8-211.1
Kazakhstan	38.0	130.1
Uzbekistan	16.4	59.2
Armenia	14.9	51.1
Tajikistan	11.0	37.5
Belarus	8.5	29.0
Kyrgyzstan	6.9	23.7
Moldova	2.2	7.4
Ukraine	0.9	3.0

Source: (Illarionov).

Table 5: Russian financial help to the members of the CIS as the percentage of their GDP

Republics	1992	January-July 1993
Uzbekistan	69.2	52.8
Kazakhstan	25.1	48.8
Turkmenistan	67.1	45.7
Tajikistan	42.3	40.9
Kyrgyzstan	22.6	23.9
Armenia	53.2	19.7
Belarus	11.9	8.8
Moldova	17.0	6.1
Ukraine	23.7	1.9
Azerbaijan	20.8	-

Source: (Illarionov).

Tabelle 6: Verschuldung in konvertirbler Währung (Jahresende, Mill. US $).

	1980	1985	1990	1991	1992(1)
Brutto	23512	25177	56191	70100(2)	80000
Netto	14940	12177	47566	61721	-
Guthaben	8572	13060	8625	8379(2)	-

(1) Schätzungen.
(2) Daten für GUS-Republiken, Ende März 1992.

Quelle: (SEF: 37).

Table 7: Economic indications of the CIS in January-September 1993 as the percentage of the January-September 1992 level

	National Income	Industrial Production	Consumer prices
Armenia	72	60	1190
Belarus	89	85	1140
Kazakhstan	83	88	1120
Kyrgyzstan	85	73	1170
Moldova	91	107	1170
Russia	86	84	1190
Tajikistan	70	74	1340
Turkmenistan	110	119	1130
Uzbekistan	101	102	820
Ukraine	88	92	2860
CIS	87	85	1530

Source: Vek, 3.12-9.12.1993, No. 47, p. 7.

Note: In Uzbekistan and Turkmenistan the resumption of economic growth has been achieved under no budget deficit.

Table 8: Average wages and salaries in some republics of the CIS (ruble) in February 1993

Russia	19610
Belarus	19200
Kazakhstani	16163
Armenia	3264
Tajikistan	4357
Ukraine	6731

Source: Wostok, 1993, No. 3, p. 53.

Table 9: Prisoner's Dilemma Game (a payoff matrix).

		Player B	
		Co-operating	Defecting
Player A	co-operating	(3,3)	(0,5)
	defecting	(5,0)	(1,1)

R - a payoff by mutual co-operation (3),
P - a payoff by mutual defecting (1),
T - a payoff for successful one-sided defecting (5),
S - a payoff under rejected co-operating (0), j = 1, 2.

A payoff matrix represents the Prisoner's Dilemma under the following conditions:

1) $T > R > P > S$,
2) $(T + S)/2 < R$.

Note: Co-operation is possible if players can help each other and a partner's co-operation advantages exceed another partner's co-operation costs. Then both players benefit from reciprocal co-operation. Still it is difficult to preserve co-operation from defection, since a short-sighted player is interested in getting co-operation benefits "free of charge". See (Axelrod).

Table 10: An optimistic scenario of Russia's Economic Development

Macro forecast of some main economic indicators

Billion ruble 1990

	1990	1995	2000
GDP	593	431	585
Investment (brutto)	136	136	224
Defense	43	20	20
Environment	7	20	30
Private consumption	345	215	271
Wages, salaries, income in kind	280	163	189

Source: Valtukh, 1993: 5.

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